

Little Salmon River Subbasin Assessment and TMDL



Department of Environmental Quality

February 2006

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Little Salmon River TMDL

February 2006

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Abbreviations, Acronyms, and Symbols

§303(d)	Refers to section 303 subsection (d) of the Clean Water Act, or a list of impaired water bodies required by this section
μ	micro, one-one thousandth
§	Section (usually a section of federal or state rules or statutes)
AU	assessment unit
AWS	agricultural water supply
BLM	United States Bureau of Land Management
BMP	best management practice
BOR	United States Bureau of Reclamation
BURP	Beneficial Use Reconnaissance Program
C	Celsius
CFR	Code of Federal Regulations (refers to citations in the federal administrative rules)
cfs	cubic feet per second
cm	centimeters
CWA	Clean Water Act
CWE	cumulative watershed effects
DEQ	Department of Environmental Quality
DO	dissolved oxygen
DWS	domestic water supply
EPA	United States Environmental Protection Agency
F	Fahrenheit
GIS	Geographical Information Systems

HUC	Hydrologic Unit Code
IDAPA	Refers to citations of Idaho administrative rules
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Lands
IDWR	Idaho Department of Water Resources
INFISH	the federal Inland Native Fish Strategy
km	kilometer
km²	square kilometer
LA	load allocation
LC	load capacity
m	meter
m³	cubic meter
mi	mile
mi²	square miles
MGD	million gallons per day
mg/L	milligrams per liter
mm	millimeter
MOS	margin of safety
NA	not assessed
NB	natural background
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit

PCR	primary contact recreation
ppm	part(s) per million
QA	quality assurance
QC	quality control
RDI	DEQ's River Diatom Index
RFI	DEQ's River Fish Index
RCA	riparian conservation area
RMI	DEQ's River Macroinvertebrate Index
SBA	subbasin assessment
SCR	secondary contact recreation
SFI	DEQ's Stream Fish Index
SHI	DEQ's Stream Habitat Index
SMI	DEQ's Stream Macroinvertebrate Index
SRW	special resource water
SS	salmonid spawning
STATSGO	State Soil Geographic Database
TDS	total dissolved solids
TMDL	total maximum daily load
TP	total phosphorus
TS	total solids
TSS	total suspended solids
U.S.	United States
U.S.C.	United States Code

USDA	United States Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Survey
WAG	Watershed Advisory Group
WBAG	<i>Water Body Assessment Guidance</i>
WBID	water body identification number
WLA	wasteload allocation
WQLS	water quality limited segment
WQS	water quality standard

Executive Summary

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section 303 of the CWA are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list of impaired waters, currently every two years. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

This document addresses water bodies in the Little Salmon River Subbasin that have been placed on what is known as the "§303(d) list" as well as other water bodies in the watershed.

This subbasin assessment and TMDL analysis has been developed to comply with Idaho's TMDL schedule. This assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions in the Little Salmon River Subbasin located in central Idaho. The first part of this document, the subbasin assessment, is an important first step leading into the TMDL. The starting point for this assessment was Idaho's current §303(d) list of water quality limited water bodies.

The subbasin assessment portion of this document examines the current status of §303(d) listed waters and defines the extent of impairment and causes of water quality limitation throughout the subbasin (Table A). The loading analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return listed waters to a condition of meeting water quality standards.

Subbasin at a Glance

The Little Salmon River Watershed (Figure A) lies entirely in central Idaho and comprises about 576 square miles. The Little Salmon River originates at about 6,280 feet off of Blue Bunch Ridge. The watershed is 45 miles long and ranges from 0.5 to 22 miles wide. Located at the 45th parallel, the watershed is about 500 miles inland from the Pacific Ocean. The river flows north for 51 miles to its confluence with the Salmon River at river mile 86.7 at Riggins (IDWR 2001). US Highway 95 parallels most of the Little Salmon River.

This watershed lies within Hydrologic Unit Code (HUC) 17060210.

Table A. Idaho 2002 §303(d)¹ listed water bodies, water body description, and pollutant of concern, Little Salmon River Watershed.

Water Body Name	Assessment Unit ID Number	2002 §303(d) Boundaries	Pollutants	Listing Basis
Little Salmon River	17060210SL001_02	Round Valley Creek to Mouth	Sediment	EPA
Little Salmon River	17060210SL007_05	5 th Order	Unknown	EPA
Little Salmon River	17060210SL007_04	4 th Order	Temperature	EPA
Big Creek	17060210SL009_02a	1 st and 2 nd Order	Unknown	DEQ
Elk Creek	17060210SL016_03	Little Elk Creek to Mouth	Sediment	USFS
Indian Creek	17060210SL001_03	Source to Mouth	Sediment	EPA
Shingle Creek	17060210SL002_02a	2 nd Order	Sediment	EPA
Brundage Reservoir	17060210SL011L-0L	Reservoir	Temperature	EPA

¹Refers to a list created in 1998 of water bodies in Idaho that did not fully support at least one beneficial use. This list is required under section 303 subsection “d” of the Clean Water Act.

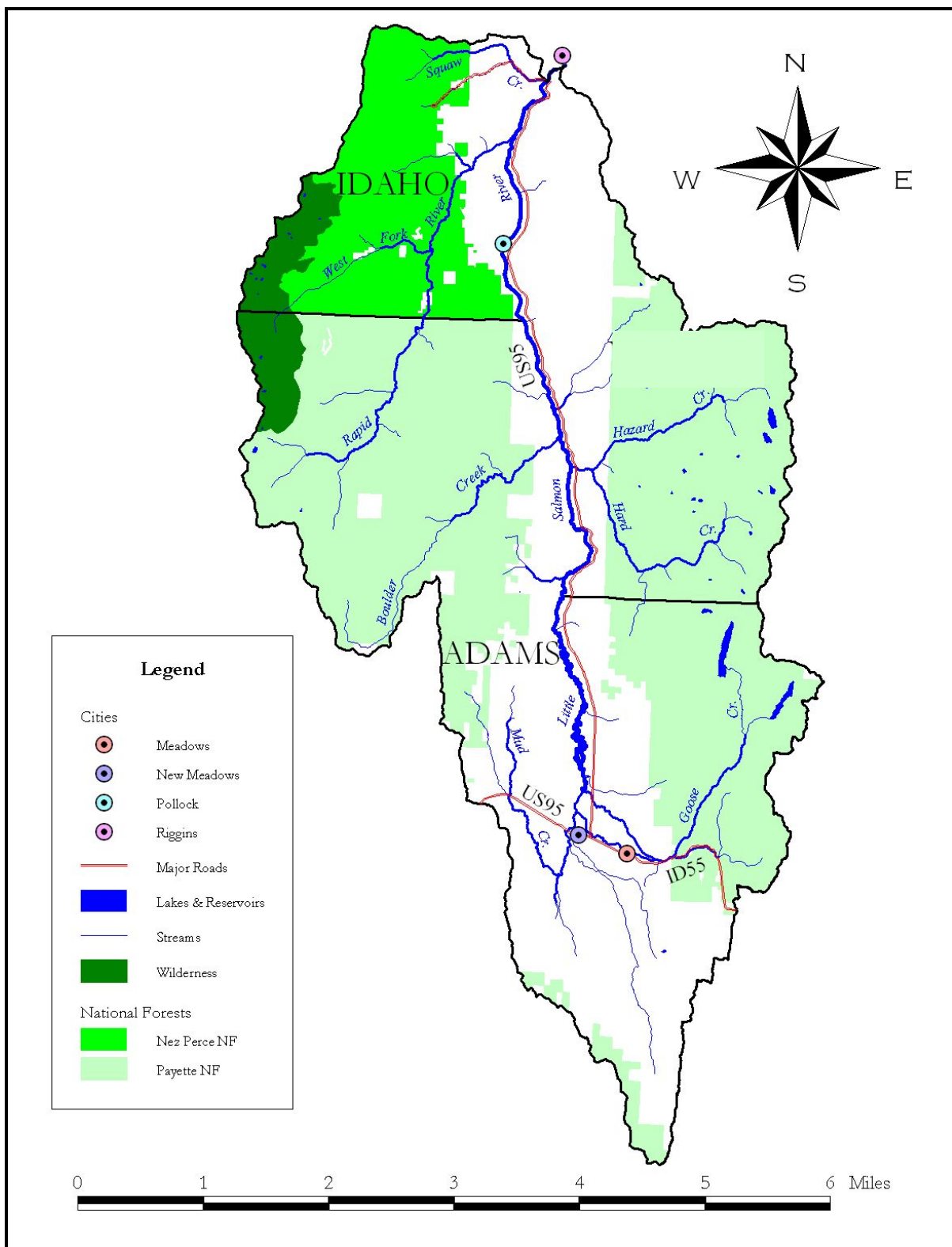


Figure A. Little Salmon River Watershed

Key Findings

TMDLs were developed for two 303(d) listed streams: the Little Salmon River (5th order assessment unit) and Big Creek (Table B): Other subbasin assessment outcomes are shown in Table C.

All streams in the watershed for which DEQ obtained information are described in section 2. Many of these streams were not on the 303(d) list of impaired waters and did not require TMDLs. The streams discussed in section 2, but not included in the executive summary because they were not on the 303(d) list and are not proposed for listing are: Mud Creek, Three Mile Creek, Four Mile Creek, Six Mile Creek, Martin Creek, Round Valley Creek, Hazard Creek, Boulder Creek, Rattlesnake Creek, Fall Creek, Denny Creek, Hat Creek, Sheep Creek, Lockwood Creek, Squaw Creek, and Rapid River. If there was enough information for these streams that a call regarding beneficial use support could be made, that was done and if there was not information to make a decision regarding beneficial use support (e.g the lower reaches of Three Mile Cree, Four Mile Creek, and Martin Creek) then that is stated.

TMDLs

The **Little Salmon River** from Big Creek to Round Valley Creek was found to have beneficial uses impaired by temperature, nutrients, and bacteria. TMDLs were developed for these pollutants. The Little Salmon River from Vicks Creek to Big Creek was found to have beneficial uses impaired by temperature. A TMDL was developed for this pollutant.

Potential natural vegetation (shade) was used as a surrogate for temperature because this would achieve natural background conditions. The temperature targets are based on IDAPA 58.01.02.200.09 which states that “when natural background conditions exceed any applicable water quality criteria set forth in Sections 21, 250, 251 or 253, the applicable water quality criteria shall not apply; instead pollutant levels shall not exceed the natural background conditions. In laymen’s terms, the temperature targets are based on a natural riparian plant cover condition over the stream. In this TMDL, the potential natural vegetation cover represents the loading capacity of the streams in terms of minimum heat load. This analysis contains an implicit margin of safety as all streams are assumed to be at potential natural vegetation when in reality natural cover can be more variable due to natural forces. Existing vegetative cover represents the existing load of heat to the streams.

The load capacity for nutrients was calculated using a target of 0.075 mg/L total phosphorus. This target was determined to prevent excessive algal growth.

Bacteria concentrations were in violation of the state standard for both primary and secondary contact recreation. A TMDL was developed based on the state standard that waters designated for primary and secondary contact recreation not contain *E. coli* bacteria significant to the public health in concentrations exceeding a geometric mean of 126 *E. coli* organisms/100mL.

The **Little Salmon River from Round Valley Creek to the mouth** showed support of beneficial uses. However, DEQ was unable to analyze the effect of coarse sediment in the system. Several government agencies including USBR and the BLM have pointed out that coarse sediment transported as part of the 1997 flood is potentially reducing salmonid spawning in places and leading to channel aggradation. DEQ proposes to list the Little Salmon River from Round Valley Creek to the mouth for habitat alteration and delist for sediment. This listing is on the basis of DEQ Beneficial Use Reconnaissance Program (BURP) scores that did not indicate impairment and low suspended sediment data. However, the listing for habitat alteration is in recognition that the system was changed due to the construction of the highway and the channel remains constricted, leading to potential coarse sediment loading problems. The state of Idaho's antidegradation policy applies in this case and existing uses must be maintained and protected from any activities that would result in human caused excess sediment delivery to the system.

Big Creek was listed for an unknown pollutant. Elevated nutrient and bacteria levels were found in the creek. TMDLs were developed for nutrients and bacteria. The load capacities were based on the same targets (0.075 mg/L total phosphorus and a geometric mean of 126 cts/100 mL of E. coli) as the Little Salmon River TMDL.

Elk Creek, Indian Creek, and Shingle Creek were all listed for sediment. Beneficial uses were fully supported in these watersheds and TMDLs are not necessary.

Brundage Reservoir was monitored weekly for temperature from early July through Mid-August 2005. Monitoring occurred in late afternoon and early evening when reservoir temperatures would be highest. No violations of the cold water temperature standard were seen. Brundage Reservoir is proposed for delisting for temperature.

Goose Creek was assessed as part of DEQ's Beneficial Use Reconnaissance Program (BURP) and was found to have impaired beneficial uses. Goose Creek is proposed for listing on the 303(d) list for an unknown pollutant. Lack of flow may be a causal factor in impairment of beneficial uses for Goose Creek. Therefore, a TMDL was not developed at this time. DEQ did not have the time during the writing of this TMDL to characterize the flows in Goose Creek to determine if intermittence was impairing beneficial uses.

Table B. Streams and Pollutants for which TMDLs Were Developed

Stream	Pollutant(s)
Little Salmon River (5 th Order –Big Creek to Round Valley Creek)	Temperature, bacteria, nutrients
Little Salmon River (4 th Order-Vicks Creek to Big Creek)	Temperature
Big Creek	Bacteria, nutrients

Table C. Summary of Assessment Outcomes for 2002 303(d) List

Waterbody Segment (assessment unit)	Pollutant	TMDL(s) Completed	Recommended Changes to §303(d) List
Little Salmon River (SL007_04)	Temperature	Temperature	None
Little Salmon River (SL007_05)	Unknown	Temperature, bacteria, nutrients	None
Little Salmon River (SL001_2)	Sediment	None	Delist for sediment List for habitat alteration
Big Creek (SL009_02a)	Unknown	Bacteria, nutrients	None
Elk Creek (SL016-03)	Sediment	None	Delist for sediment
Indian Creek (SL01-03)	Sediment	None	Delist for sediment
Shingle Creek (SL002-02a)	Sediment	None	Delist for sediment
Brundage Reservoir (SL011L-0L)	Temperature	None	Delist for temperature
Goose Creek (SL010_04)	Unknown	None	List for an unknown pollutant

Public Participation

DEQ has complied with the WAG consultation requirements set forth in Idaho Code § 39-3611. A WAG was officially formed in May 2004 for the Little Salmon River TMDL. DEQ provided the WAG with information concerning applicable water quality standards, water quality data, monitoring, assessments, reports, procedures, and schedules. The Little Salmon River WAG was officially recognized by DEQ in May of 2004. The group met regularly over the course of the development of the TMDL in New Meadows. In 2005, the WAG met January 31st, April 5th, June 14th, August 23rd, September 15th and December 8th. In 2004, the WAG met on May 17th, July 12th and September 15th.

DEQ utilized the knowledge, expertise, experience and information of the WAG in developing this TMDL. DEQ also provided the WAG with an adequate opportunity to participate in drafting the TMDL, reviewing draft versions of the TMDL and suggesting changes to the document.

Concern from some WAG members was expressed at the high reductions required for Big Creek for bacteria. In particular, those WAG members wondered if these reductions were

possible. A WAG member pointed out that the E. coli present from the largely grass fed cows in the Meadows Valley area are far less virulent than the strains of E. coli that are excreted from grain fed cows.

At the end of the September 15, 2005 meeting of the Little Salmon River WAG, the WAG members present voted their approval to go out for public comment with the Little Salmon River TMDL. A public meeting was held on November 10th, 2005. The three WAG members present at a meeting on February 9, 2006 voted their approval to submit the final draft to EPA. Since a majority was not present, a majority vote was solicited by DEQ by mail and email. A majority vote was obtained on February 22nd.

One WAG voting member voted against submitting the TMDL to EPA because he felt that the sections on Mud Creek, Three Mile Creek, Four Mile Creek, Six Mile Creek and Martin Creek were impaired for beneficial uses and that additional data needed to be collected to ascertain whether or not this is the case. He stated that there had been significant discussion of these creeks and whether or not they were impaired but additional monitoring was not conducted during the course of TMDL development.

He stated that Kirk Campbell from the Idaho Department of Agriculture in his report "Little Salmon River Year Two Water Quality Report April 2005 through October 2005" that beneficial uses are impaired from data he collected on the Four Mile Creek site as well as other sites to be higher amounts than what meets the state tolerances. Mr. Campbell also stated at the December 2005 WAG meeting that Four Mile Creek was impaired rather than undetermined. The WAG member stated at that meeting that Leslie Freeman from DEQ would check into the alternatives of listing Three Mile, Four Mile and Martin Creek. That has not been done to this member's satisfaction.

The WAG member went on to state that these creeks are likely to be elevated nutrient/bacteria/temperature transporting streams that flow into the Little Salmon River as described by Kirk Campbell in his report on Four Mile Creek because of their similarity.

Also, DEQ did not include information in the TMDL on proposed monitoring in 2006 of Four Mile, Three Mile, Martin, Squaw and Six Mile Creeks (monitoring that was supported by a vote of the WAG). The member also stated that DEQ did not clearly delineate that lack of information prevented the agency from making a beneficial use support status call on the lower reaches of these creeks (see section 2 for more details on these specific streams). In addition, 2005 monitoring information was not presented in the TMDL.

The Idaho Department of Agriculture will monitor those streams if they can obtain access to them from the landowners in 2006. The WAG member emphasized that documentation of whether or not access was granted by landowners needed to occur in the TMDL in order to lend credibility to the document. Four Mile Creek was monitored sporadically in 2005 and not enough data was collected to determine whether the creek was impaired or unimpaired. This past and future monitoring will help delineate nutrient/bacteria loading to the system for the purposes of implementation planning for the mainstem Little Salmon River. If

information regarding beneficial use impairment is gathered during this monitoring, it may be submitted to DEQ for 303(d) (integrated report) listing.